Organic jan 9

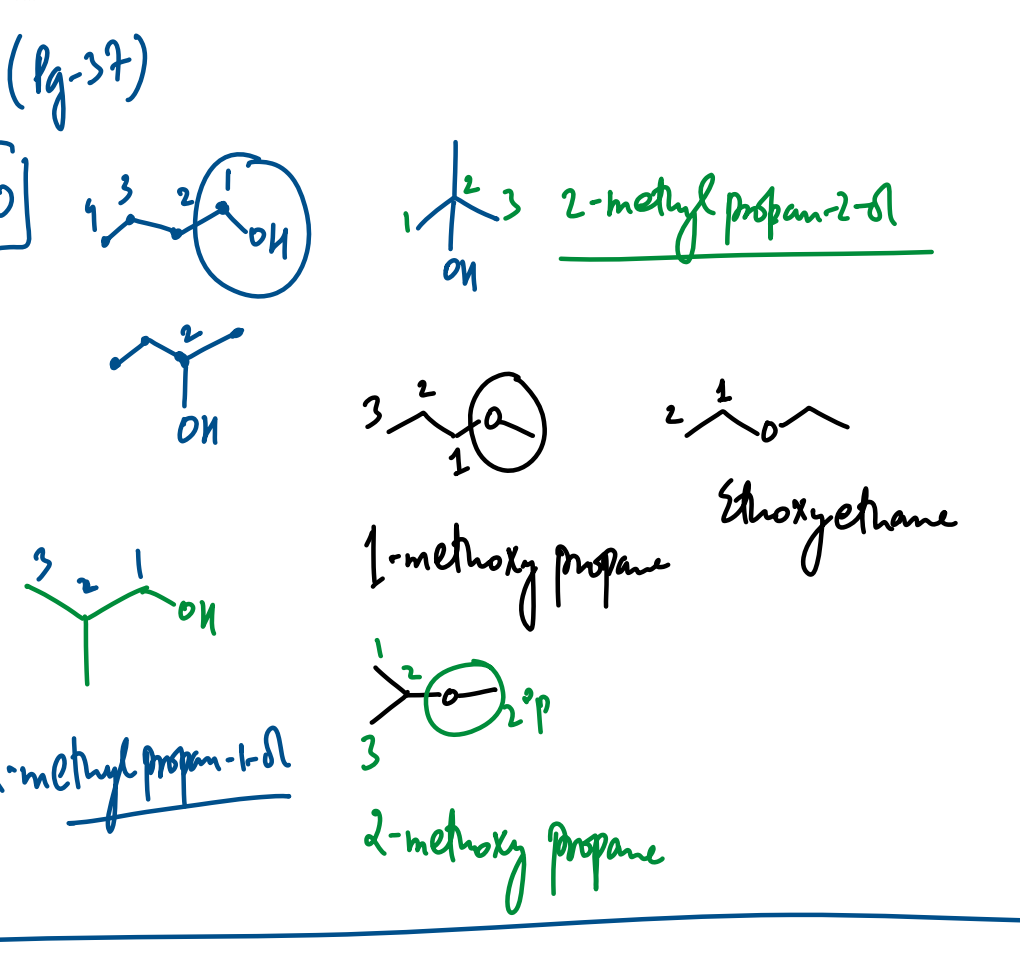
Saturday, December 31, 2022 12:01 PM

Doubt Ex→9.3 (Pg-37)

(16) $C_4H_{10}O$

DU = 0

Total 7



% enol content (Pg-24) ⇒ Make Table in your notebook.

↳ Amount of enol form

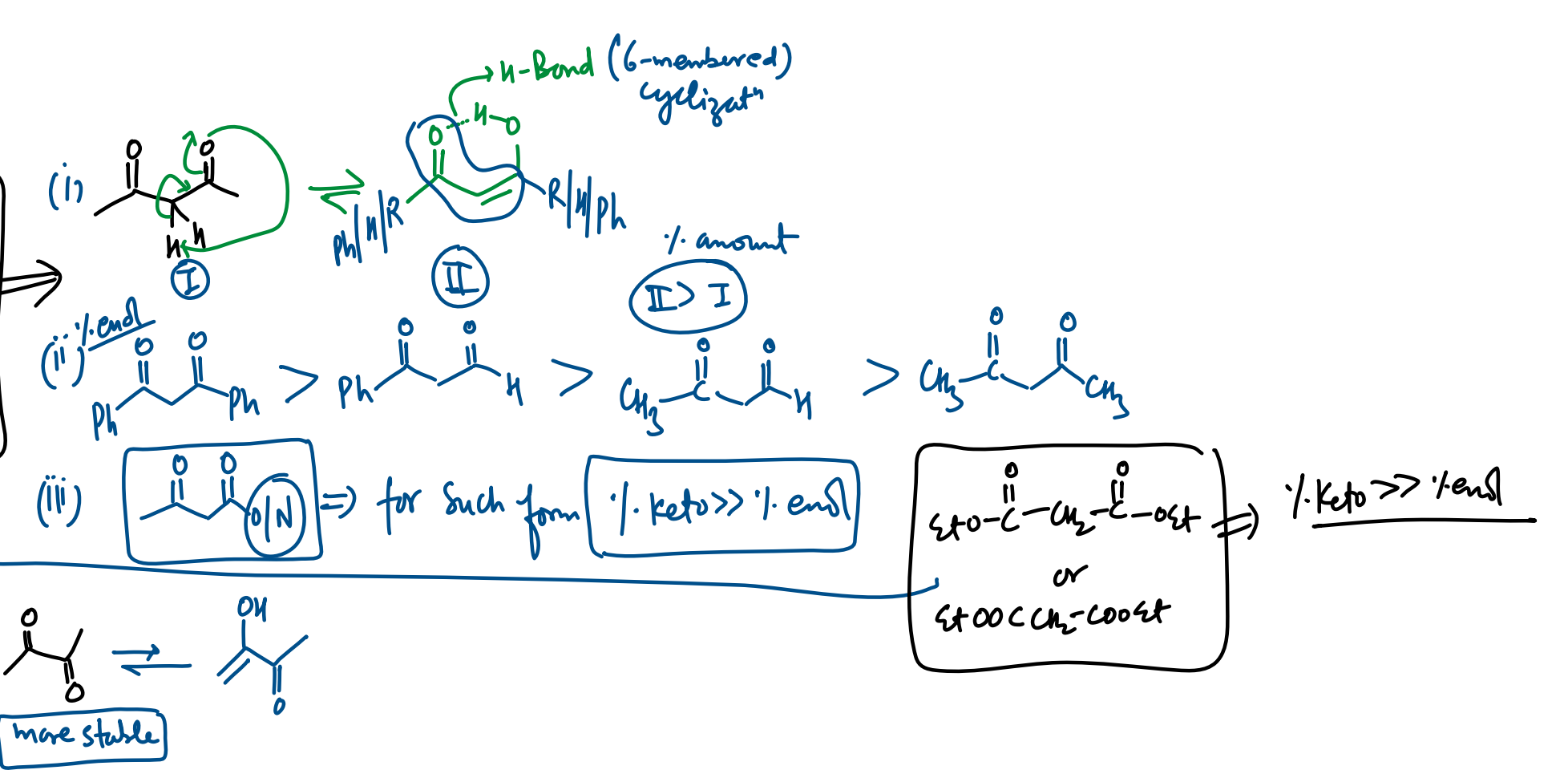
- Usually keto form is more stable than enol & has high % keto form than % enol form.

But enol form can be more stable than keto form

if ① In 1,3 dicarbonyl system

Intramolecular H-Bonding + Conjugation of C=C with C=O or Resonance of C=C & C=O

And terminals of 1,3 dicarbonyl system has H or carbon.



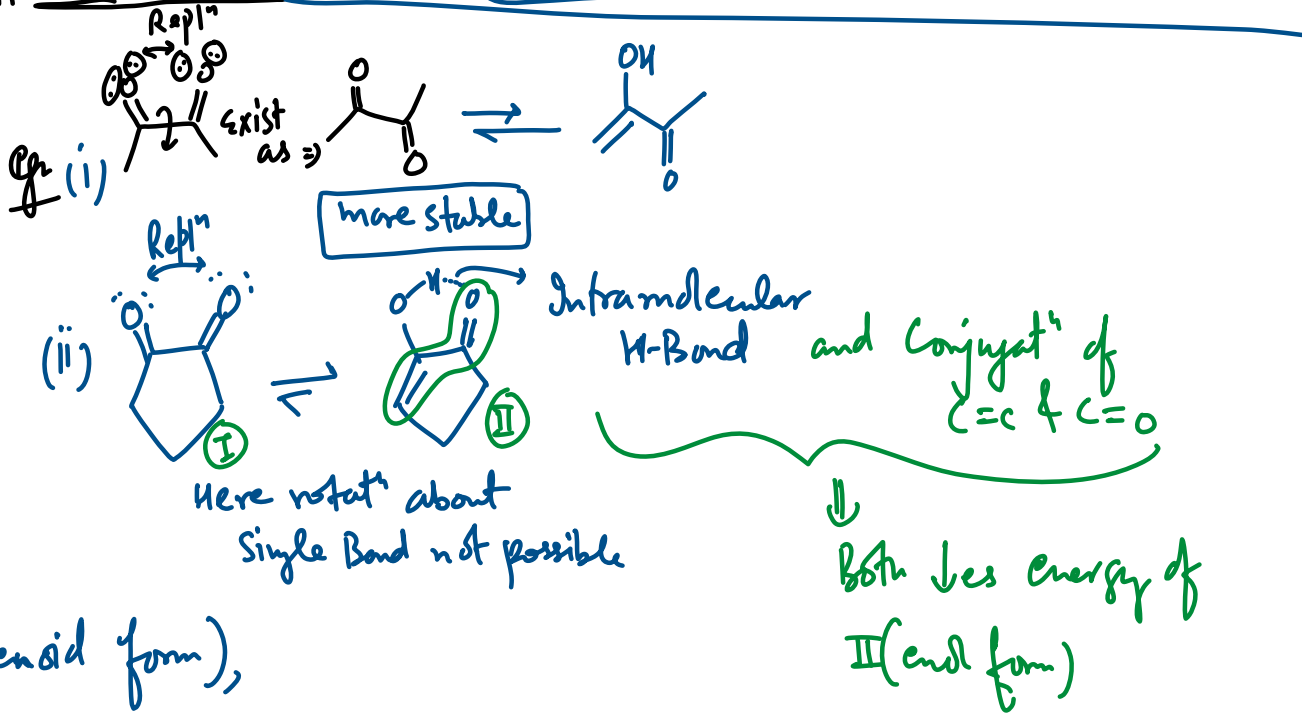
(iii) ⇒ for such form % keto >> % enol

$EtO-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-OEt$ or $EtOOCCH_2-COOEt$ ⇒ % keto >> % enol

② In 1,2 dicarbonyl system

⇒ Cyclic form has more % enol than % keto

⇒ Acyclic form has more % keto than % enol



Here rotation about single bond not possible

Intramolecular H-Bond and Conjugation of C=C & C=O

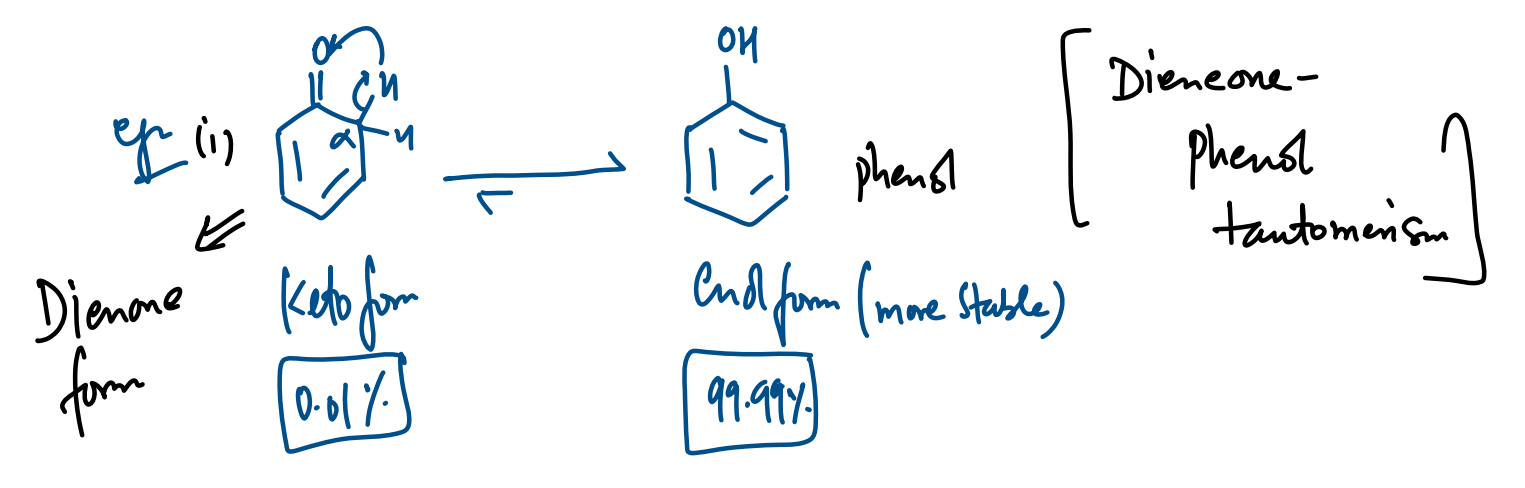
⇓

Both ↓es energy of II (enol form)

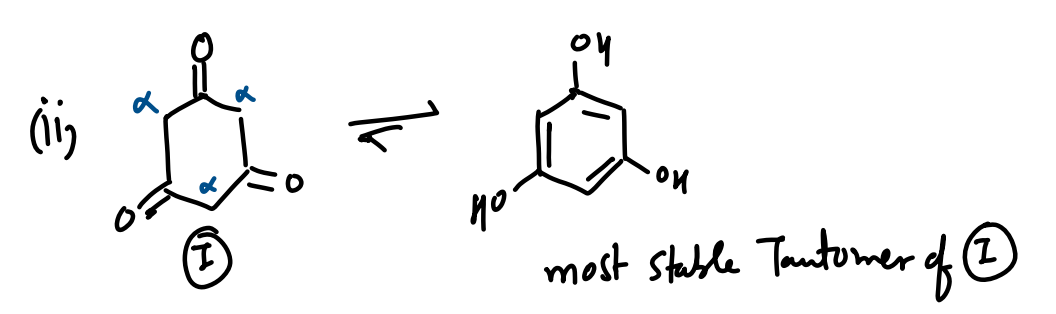
So, % enol > % keto

$\boxed{II > I}$ stable

③ If enol achieves Aromatic character (like Benzenoid form), then % enol >>> % keto



[Dieneone-Phenol tautomerism]



most stable Tautomer of (I)

more stable than I

To ↑ % enol content, Take non-polar solvent → n-hexane or Benzene or CCl_4 or CS_2

% enol content in Non-polar > Polar Aprotic > polar protic

Solvent
- Polar Protic: H_2O, ROH (Alcohol), RCOOH
- Polar Aprotic: $CH_3-\overset{O}{\overset{\|}{C}}-CH_3$, $CH_3-\overset{O}{\overset{\|}{S}}-CH_3$ DMSO → Dimethyl Sulphoxide; DMF → Dimethyl formamide ($H-\underset{O}{\underset{\|}{C}}-N\begin{smallmatrix}CH_3\\CH_3\end{smallmatrix}$)
- Non-polar & Very less polar: CCl_4, CS_2, $CHCl_3$, CH_2Cl_2, ether, Benzene, etc

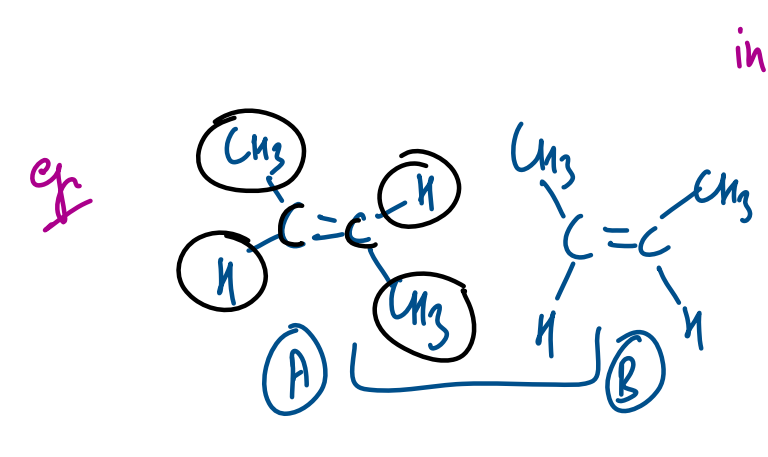
---

Stereoisomerism ⇒ Same Bond Connectivity, Different arrangement.

↳ Same 2°P, 1°P, W.R, 1°S, 2°S

Types →
① Geometrical Isomerism
② Optical Isomerism
③ Conformational Isomerism

(I) Geometrical Isomerism (G.I) :- Isomeric relationship b/w two compound which are not interconverted into each other due to restricted rotation.



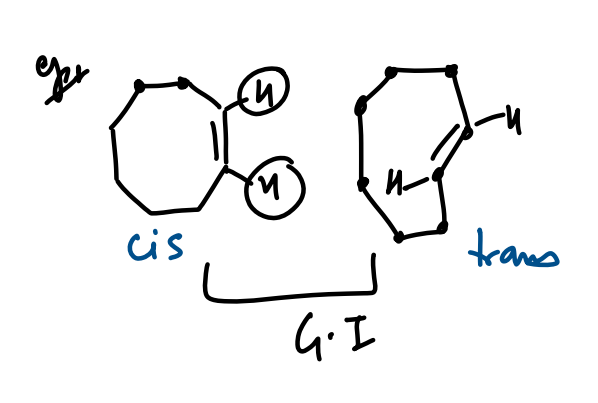
A & B are Geometrical Iso

A & B cannot be interconverted into each other by very high Rotational Barrier about C=C or have rotational restriction about C=C, i.e; these two compounds are different, having Different physical Prop. & Chemical Properties.

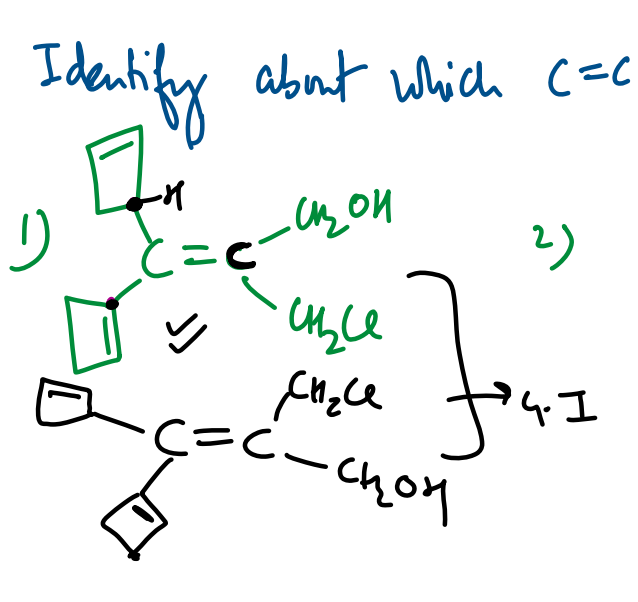
G.I can be observed about
① C=C
② C-C in cyclic compound
③ C=N
④ N=N

G.I about C=C is possible only if
⇒ Each Carbon of C=C has 2 different groups/atoms.
⇒ Groups of Both Carbon can be same/Common.

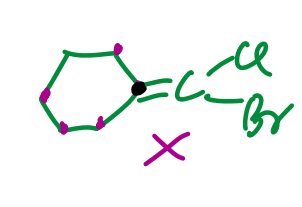
G.I about C=C, C=N, N=N in Ring only possible when Ring is 8-membered or above

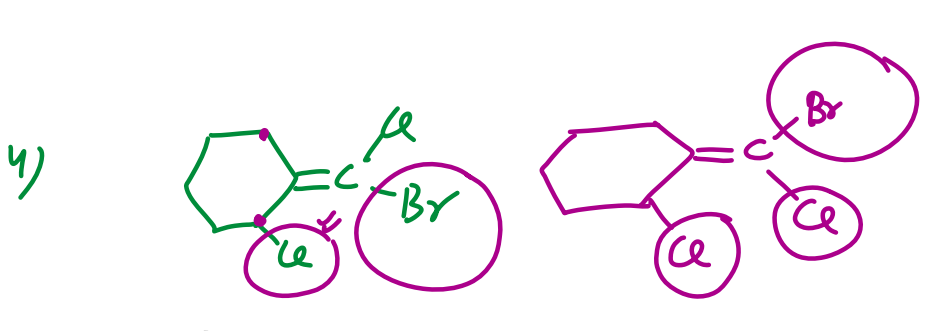


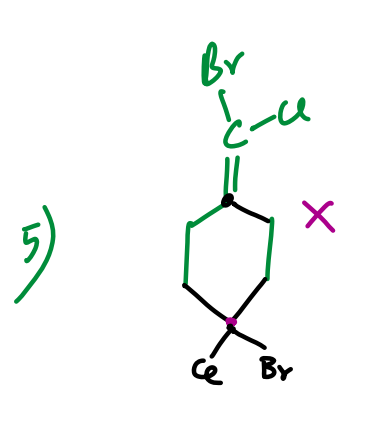
Q. Identify about which C=C, G.I is possible?

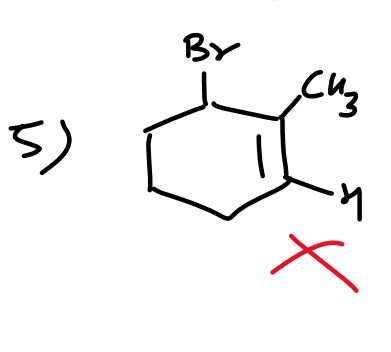


2) $CH_2=CH-CH=CH-CH=CH-CH_3$ ✗ ✓ ✓



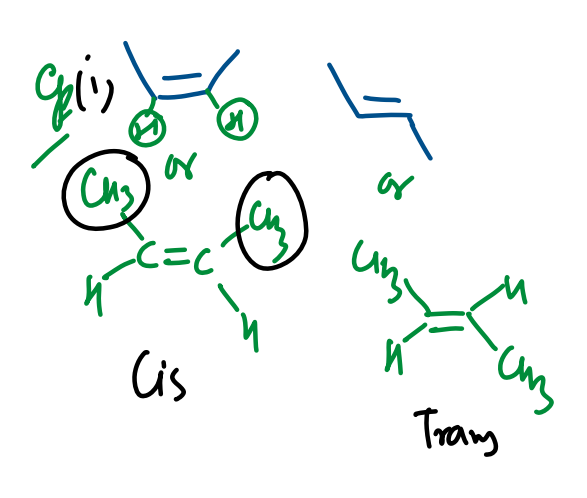


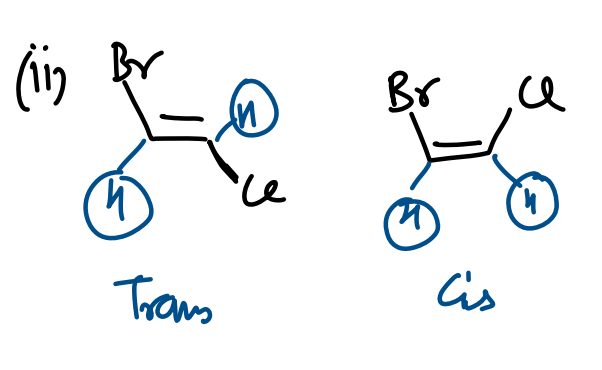




Naming of G.Is about C=C

i) cis-Trans → when atleast one group is common on Both Carbons
⇒ Common group same side → Cis-form of Geometrical Isomer
⇒ Common Group opp. side → Trans-form of G.I





(ii) When Nothing is common then E-Z Naming is followed. E/Z Naming can also be used for cis-Trans forms.

E → Entgegen ⇒ opposite

Z → Zusamen ⇒ togetherness (Same side)

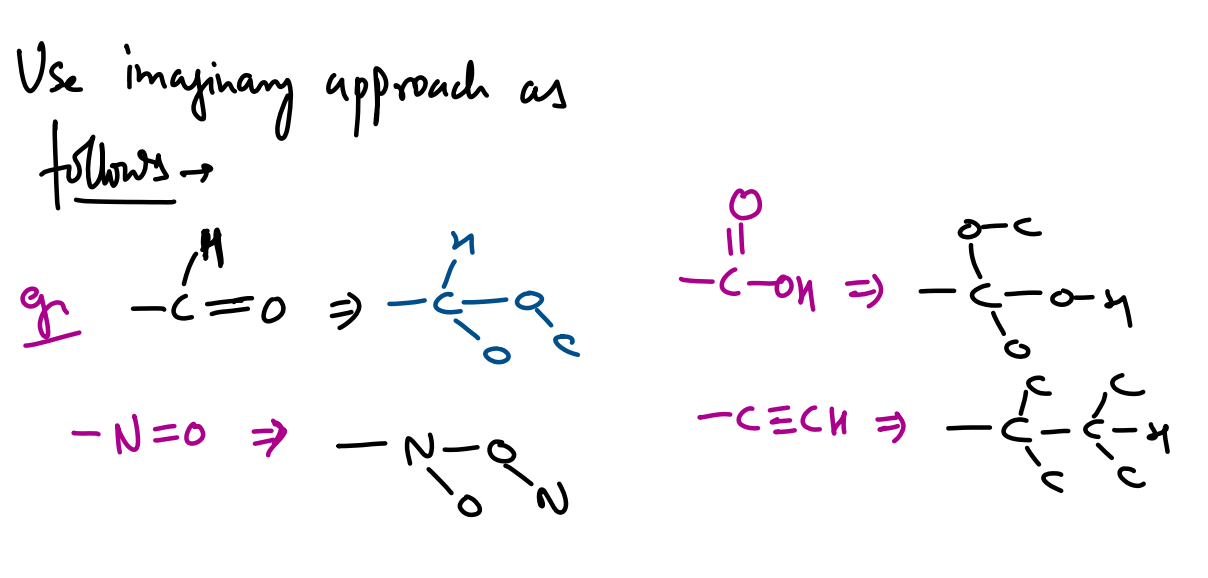
⇒ E/Z Notation is governed by CIP Rule (Cahn, Ingold, Prelog)

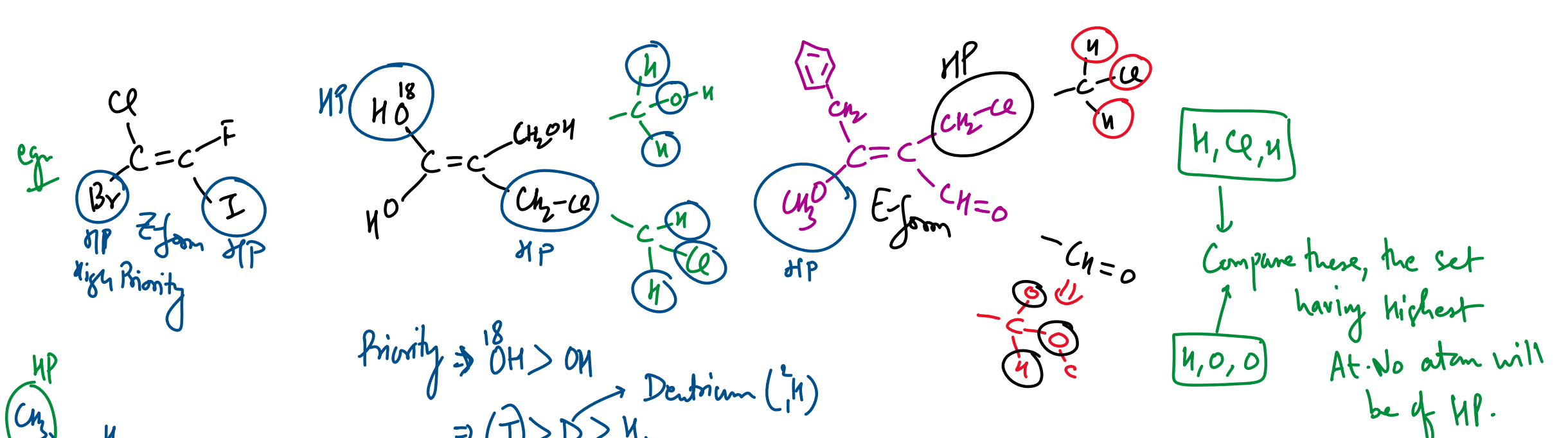
1) Priority of Group ∝ atomic No. of first atom connected to double Bonded carbon.

2) If first atom is same, then compare atomic No of Next. & If at. No. of Next atom is also same, then don't stop; Keep Comparing until different atoms are compared.

3) In Case of comparison of isotopes, Consider their mass No.

4) For multiple Bond situation → Use imaginary approach as follows → (double or Triple)

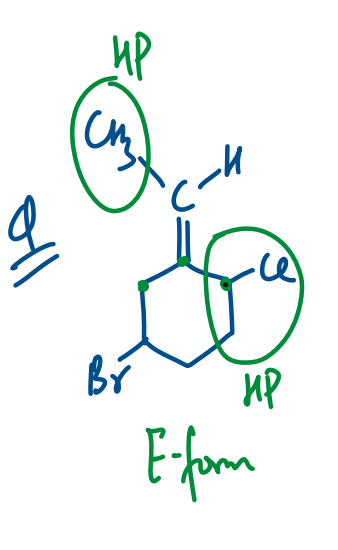




Compare these, the set having highest At. No atom will be of HP.

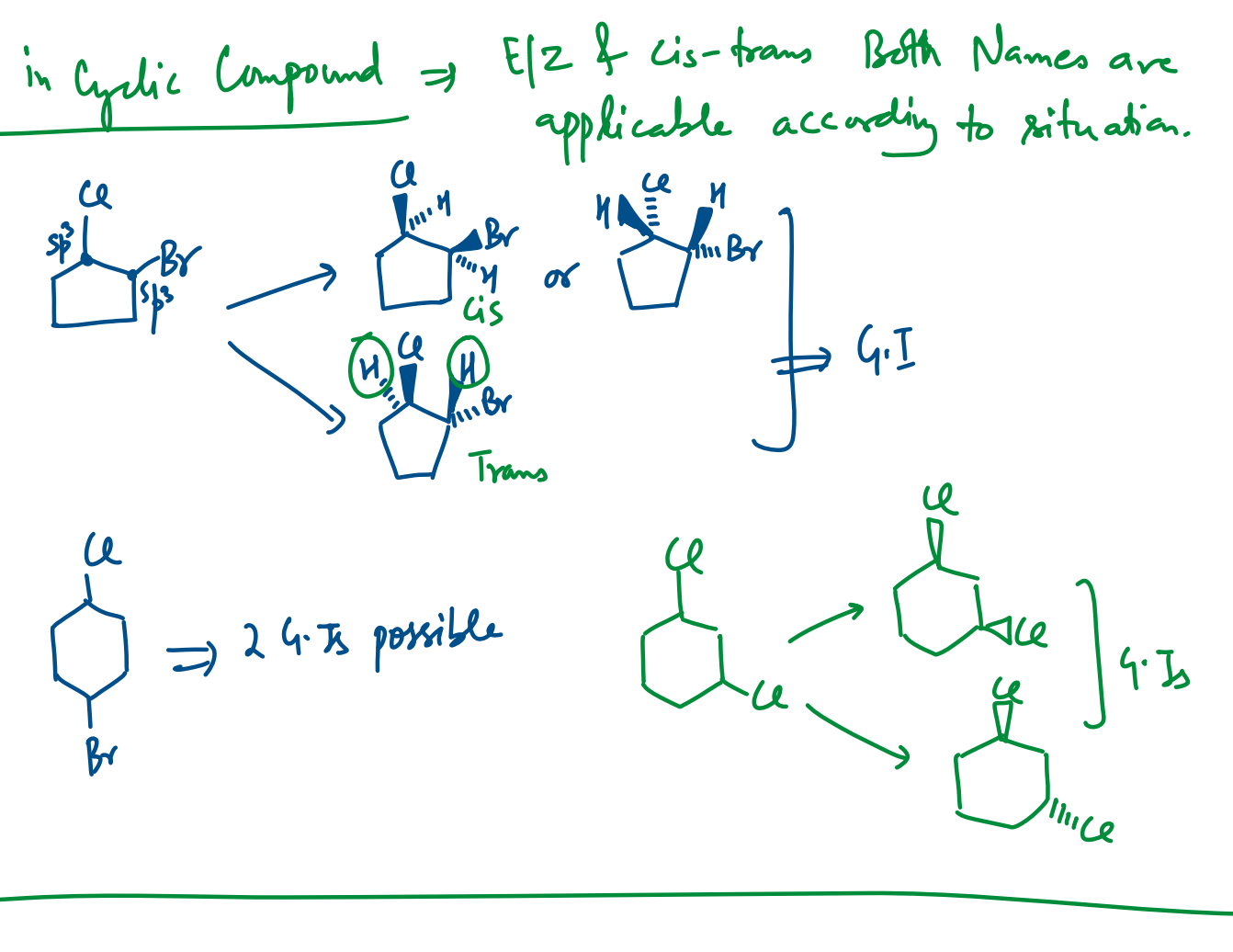
Priority ⇒ $^{18}OH > OH$

⇒ T > D > H (Tritium ^3_1H, Deuterium ^2_1H, Protium (P))

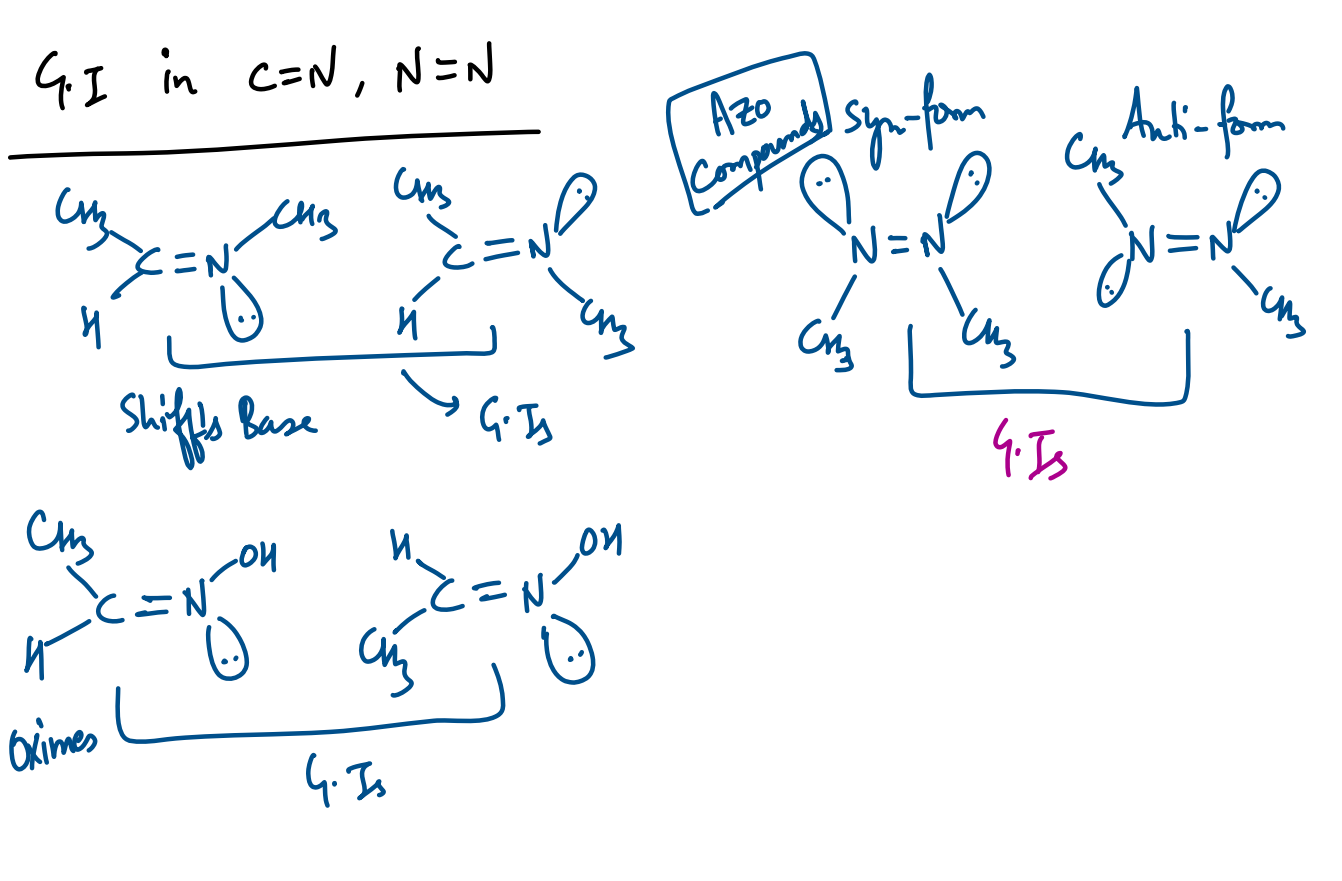


find E/Z Notation about C=C ?

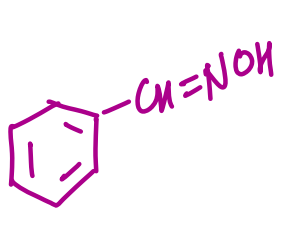
G.I in Cyclic Compound ⇒ E/Z & cis-trans Both Names are applicable according to situation.



G.I in C=N, N=N



Q.



shows G.I or Not?

Ans. Yes possible